

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 3 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

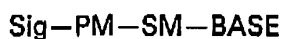
**Amendments to the Claims:**

This listing of the claims below will replace all prior versions and listing of claims in this application.

**Listing of Claims:**

Claims 1-955 (Canceled)

956. (Currently Amended) An oligo- or polynucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polynucleotide comprising at least one modified nucleotide or modified nucleotide analog having the formula



wherein PM is a phosphate moiety, SM is a ~~sugar~~ furanosyl moiety and BASE is a base moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine or a deazapurine analog wherein said analog can be attached to or coupled to or incorporated ~~into~~ into DNA or RNA wherein said analog does not substantially interfere with double helix formation or nucleic acid hybridization, said PM being attached to SM, said BASE being attached to SM, and said Sig being covalently attached to PM directly or through a chemical linkage, and wherein said Sig comprises a non-polypeptide, ~~non-nucleotidyl~~, non-radioactive label moiety which can be directly or indirectly detected when attached to PM or when said modified nucleotide is incorporated into said oligo- or polynucleotide or when said oligo- or polynucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof, and wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, ~~a saccharide component~~ or a combination of any of the foregoing.

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 4 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

957. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein Sig comprises at least three carbon atoms.

958. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said magnetic component comprises magnetic oxide.

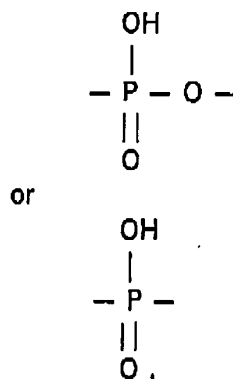
959. (Previously Presented) The oligo- or polynucleotide of claim 958, wherein said magnetic oxide comprises ferric oxide.

960. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said metal-containing component is catalytic.

961. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

Claims 962-963. (Canceled)

964. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said covalent attachment comprises



Enz-5(D6)(C2)

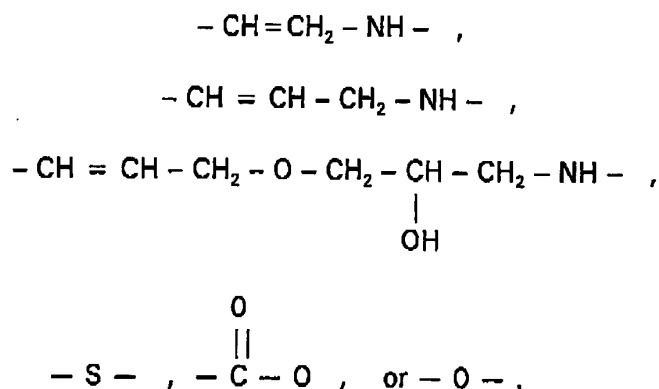
Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
 Page 5 [Second Supplemental Amendment (Following Applicants' September 3,  
 2004 Amendment Under 37 C.F.R. §1.116) – March 30, 2005]

965. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

966. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said chemical linkage comprises a  $-\text{CH}_2\text{NH}-$  moiety.

967. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said chemical linkage comprises an allylamine group.

968. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said chemical linkage comprises any of the moieties:



969. (Canceled)

970. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said PM comprises a monophosphate, a diphosphate or a triphosphate.

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 6 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

971. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said Sig moiety is covalently attached to said PM through a phosphorus atom or phosphate oxygen.

972. (Currently Amended) The oligo- or polynucleotide of claim 956, wherein said Sig moiety is attached to the ~~furanosyl moiety~~ PM of a terminal nucleotide in said oligo- or polydeoxyribonucleotide.

973. (Previously Presented) The oligo- or polynucleotide of claim 972, wherein the furanosyl moiety of said terminal nucleotide comprises a hydrogen atom at the 2' position thereof.

974. (Previously Presented) The oligo- or polynucleotide of claim 972, wherein the furanosyl moiety of said terminal nucleotide comprises an oxygen atom at the 2' position thereof.

975. (Previously Presented) The oligo- or polynucleotide of claim 973, wherein the furanosyl moiety of said terminal nucleotide comprises a hydrogen atom at the 3' position thereof.

976. (Previously Presented) The oligo- or polynucleotide of claim 974, wherein the furanosyl moiety of said terminal nucleotide comprises an oxygen atom at the 3' position thereof.

977. (Canceled)

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 7 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

978. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

979. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

980. (Previously Presented) The oligo- or polynucleotide of claim 979, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

981. (Previously Presented) The oligo- or polynucleotide of claim 979, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

982. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs or a combination of any of the foregoing.

983. (Previously Presented) The oligo- or polynucleotide of claim 982, wherein said adenosine analogs comprise tubericidin and toyocamycin.

984. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide.

985. (Currently Amended) The oligo- or polynucleotide of claim ~~984~~ 956, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide and further comprises at least one ribonucleotide.

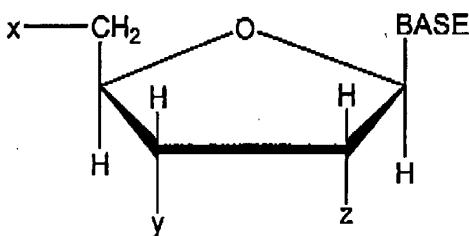
Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
 Page 8 [Second Supplemental Amendment (Following Applicants' September 3,  
 2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

986. (Previously Presented) The oligo- or polynucleotide of claim 956, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide.

987. (Currently Amended) The oligo- or polynucleotide of claim ~~986~~ 956, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide and further comprises at least one deoxyribonucleotide.

988. (Currently Amended) An oligo- or polynucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polynucleotide comprising at least one modified nucleotide or a modified nucleotide analog having the structural formula:



wherein BASE is a moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine or a deazapurine analog, wherein said analog can be attached to or coupled to or incorporated into DNA or RNA, wherein said analog does not substantially interfere with double helix formation or nucleic acid hybridization, and wherein said BASE is attached to the 1' position of the furanosyl ring from the N1 position when said BASE is a pyrimidine or a pyrimidine analog, or from the N9 position when said BASE is a purine, a purine analog, a deazapurine or a deazapurine analog;

wherein x comprises H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate;

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 9 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

wherein y comprises H— , HO— , a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein z comprises H— , HO— , a mono-phosphate, a di-phosphate or a tri-phosphate; and

wherein Sig is covalently attached directly or through a chemical linkage to at least one phosphate comprising x, y, z, or a combination thereof, and wherein said Sig comprises a non-polypeptide, ~~non-nucleotidyl~~, non-radioactive label moiety which can be directly or indirectly detected when attached to said phosphate or when said modified nucleotide is incorporated into said oligo- or polynucleotide or when said oligo- or polynucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof, wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, ~~a saccharide component~~ or a combination of any of the foregoing.

989. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein Sig comprises at least three carbon atoms.

990. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said magnetic component comprises magnetic oxide.

991. (Previously Presented) The oligo- or polynucleotide of claim 990, wherein said magnetic oxide comprises ferric oxide.

992. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said metal-containing component is catalytic.

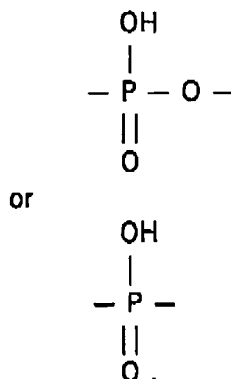
Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 10 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

993. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

Claims 994-995. (Canceled)

996. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said covalent attachment comprises



997. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

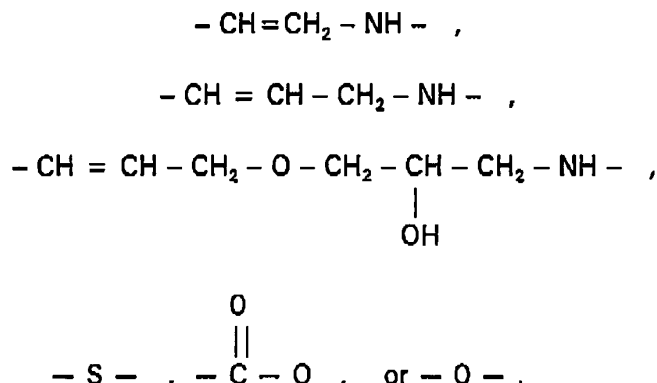
998. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said chemical linkage comprises a  $-\text{CH}_2\text{NH}-$  moiety.

999. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said chemical linkage comprises an allylamine group.

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
 Page 11 [Second Supplemental Amendment (Following Applicants' September 3,  
 2004 Amendment Under 37 C.F.R. §1.116) – March 30, 2005]

1000. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said chemical linkage comprises any of the moieties:



1001. (Canceled)

1002. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said x comprises a monophosphate, a diphosphate or a triphosphate and y comprises a monophosphate.

1003. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said Sig moiety is covalently attached to said phosphate through a phosphorus atom or phosphate oxygen.

1004. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said x comprises a monophosphate.

1005. (Currently Amended) The oligo- or polynucleotide of claim 988, wherein said Sig moiety is attached to the ~~furanesyl~~ phosphate moiety of a terminal nucleotide in said oligo- or polynucleotide.

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 12 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

1006. (Previously Presented) The oligo- or polynucleotide of claim 1005, wherein z of said furanosyl moiety of said terminal nucleotide comprises a hydrogen atom.

1007. (Previously Presented) The oligo- or polynucleotide of claim 1005, wherein z of said furanosyl moiety of said terminal nucleotide comprises an oxygen atom.

1008. (Currently Amended) The oligo- or polynucleotide of claim 1006, wherein y of said furanosyl moiety ~~comprises~~ comprises a hydrogen atom.

1009. (Previously Presented) The oligo- or polynucleotide of claim 1007, wherein y of said furanosyl moiety comprises an oxygen atom.

1010. (Canceled)

1011. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

1012. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

1013. (Previously Presented) The oligo- or polynucleotide of claim 1012, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

1014. (Previously Presented) The oligo- or polynucleotide of claim 1012, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 13 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

1015. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs, or a combination of any of the foregoing.

1016. (Previously Presented) The oligo- or polynucleotide of claim 1015, wherein said adenosine analogs comprise tubercidin or toyocamycin.

1017. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide.

1018. (Currently Amended) The oligo- or polynucleotide of claim ~~1017~~ 988, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide and further comprises at least one ribonucleotide.

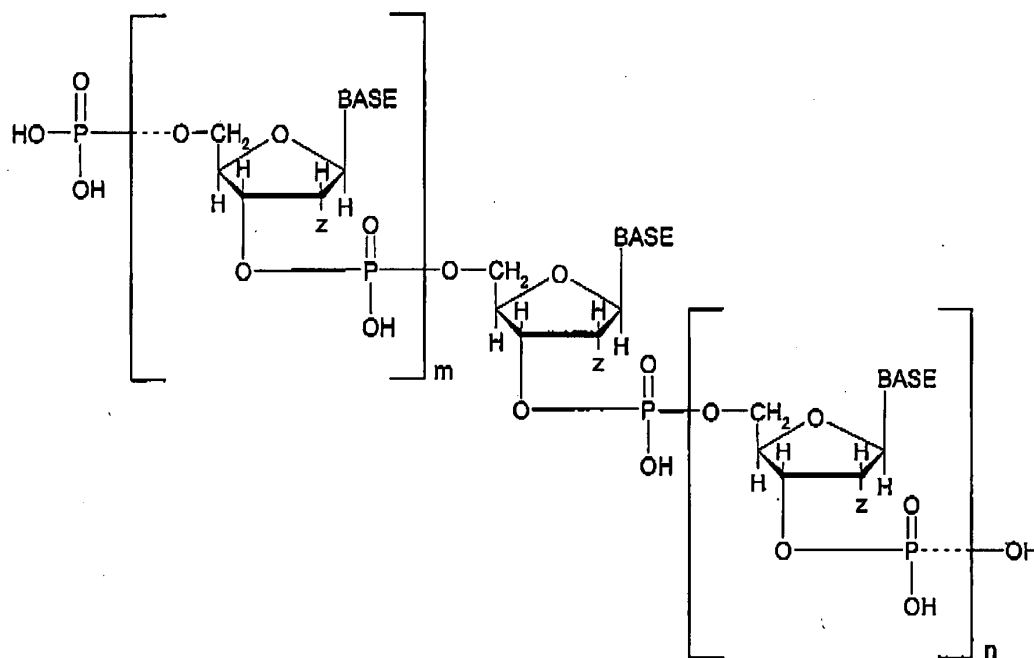
1019. (Previously Presented) The oligo- or polynucleotide of claim 988, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide.

1020. (Currently Amended) The oligo- or polynucleotide of claim ~~1019~~ 988, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide and further comprises at least one ~~deoxyribonucleotide~~ deoxyribonucleotide.

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 14 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. § 1.116) -- March 30, 2005]

1021. (Previously Presented) The oligo- or polynucleotide of claim 988, having the structural formula:

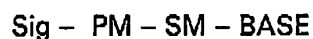


wherein m and n represent integers from 0 up to about 100,000, and wherein said Sig moiety is attached to at least one of the phosphate moieties in said structural formula.

**Enz-5(D6)(C2)**

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 15 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

1022. (Currently Amended) An oligo- or polynucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polynucleotide comprising at least one modified nucleotide or a modified nucleotide analog having the formula



wherein PM is a phosphate moiety, SM is a furanosyl moiety and BASE is a base moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine or a deazapurine analog, wherein said analog can be attached to or coupled to or incorporated into DNA or RNA, wherein said analog does not substantially interfere with double helix formation or nucleic acid hybridization, said PM is attached to SM, said BASE is attached to SM, said Sig is covalently attached to PM directly or via a chemical linkage, and wherein said Sig comprises a non-polypeptide, ~~non-nucleotidyl~~, non-radioactive label moiety which can be directly or indirectly detected when attached to PM or when said modified nucleotide is incorporated into said oligo- or polynucleotide, or when said oligo- or polynucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof, provided that when said oligo- or polynucleotide is an oligoribonucleotide or a polyribonucleotide, and when Sig is attached through a chemical linkage to a terminal PM at the 3' position of a terminal ribonucleotide, said chemical linkage is not obtained through a 2',3' vicinal oxidation of a 3' terminal ribonucleotide previously attached to said oligoribonucleotide or polyribonucleotide, and wherein said Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, ~~a saccharide component~~ or a combination of any of the foregoing.

1023. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein Sig comprises at least three carbon atoms.

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 16 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

1024. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said magnetic component comprises magnetic oxide.

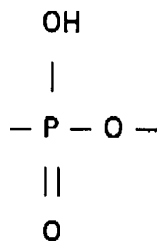
1025. (Previously Presented) The oligo- or polynucleotide of claim 1024, wherein said magnetic oxide comprises ferric oxide.

1026. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said metal-containing component is catalytic.

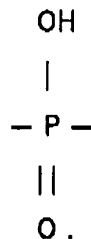
1027. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

Claims 1028-1029. (Canceled)

1030. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said covalent attachment comprises



or



Enz-5(D6)(C2)

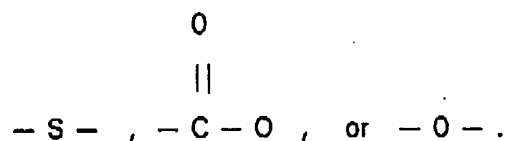
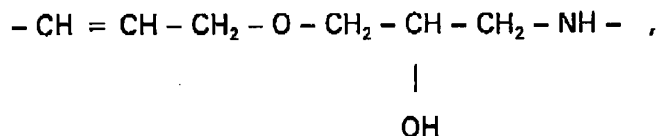
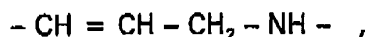
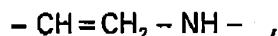
Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
 Page 17 [Second Supplemental Amendment (Following Applicants' September 3,  
 2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

1031. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

1032. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said chemical linkage comprises a  $-\text{CH}_2\text{NH}-$  moiety.

1033. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said chemical linkage comprises an allylamine group.

1034. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said chemical linkage comprises any of the moieties:



1035. (Canceled)

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 18 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) – March 30, 2005]

1036. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said PM comprises a monophosphate, a diphosphate or a triphosphate.

1037. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said Sig moiety is covalently attached to said PM through a phosphorus atom or phosphate oxygen.

1038. (Currently Amended) The oligo- or polynucleotide of claim 1022, wherein said Sig moiety is attached to the ~~furanosyl moiety~~ PM of a terminal nucleotide in said oligo- or polynucleotide.

1039. (Previously Presented) The oligo- or polynucleotide of claim 1038, wherein the furanosyl moiety of said terminal nucleotide has a hydrogen atom at the 2' position thereof.

1040. (Previously Presented) The oligo- or polynucleotide of claim 1038, wherein the furanosyl moiety of said terminal nucleotide has an oxygen atom at the 2' position thereof.

1041. (Previously Presented) The oligo- or polynucleotide of claim 1039, wherein the furanosyl moiety of said terminal nucleotide has a hydrogen atom at the 3' position thereof.

1042. (Previously Presented) The oligo- or polynucleotide of claim 1040, wherein the furanosyl moiety of said terminal nucleotide has an oxygen atom at the 3' position thereof.

1043. (Canceled)

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 19 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

1044. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

1045. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

1046. (Previously Presented) The oligo- or polynucleotide of claim 1045, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

1047. (Previously Presented) The oligo- or polynucleotide of claim 1045, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

1048. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs or a combination of any of the foregoing.

1049. (Previously Presented) The oligo- or polynucleotide of claim 1048, wherein said adenosine analogs comprise tubercidin and toyocamycin.

1050. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide.

**Enz-5(D6)(C2)**

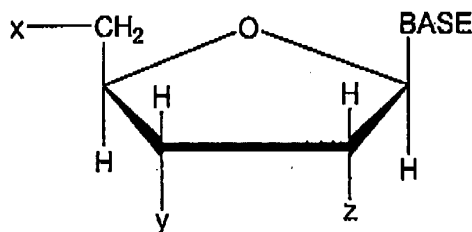
Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 20 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

1051. (Currently Amended) The oligo- or polynucleotide of claim ~~1050~~ 1022, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide and further comprises at least one ribonucleotide.

1052. (Previously Presented) The oligo- or polynucleotide of claim 1022, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide.

1053. (Currently Amended) The oligo- or polynucleotide of claim ~~1052~~ 1022, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide and further comprises at least one deoxyribnucleotide.

1054. (Currently Amended) An oligo- or polynucleotide which is complementary to a nucleic acid of interest or a portion thereof, said oligo- or polynucleotide comprising at least one modified nucleotide or a modified nucleotide analog having the structural formula:



wherein BASE is a moiety comprising a pyrimidine, a pyrimidine analog, a purine, a purine analog, a deazapurine, a deazapurine analog, wherein said analog can be attached to or coupled to or incorporated into DNA or RNA wherein said analog does not substantially interfere with double helix formation or nucleic acid hybridization, and wherein BASE is attached to the 1' position of the furanosyl ring from the N1 position when BASE is a pyrimidine or a pyrimidine analog, from the N9 position of the furanosyl ring when BASE is a purine, a purine analog, a deazapurine or a deazapurine;

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 21 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

wherein x comprises of H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein y comprises of H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate;

wherein z comprises of H—, HO—, a mono-phosphate, a di-phosphate or a tri-phosphate; and

wherein said Sig is covalently attached directly or through a chemical linkage to at least one phosphate comprising of x, y and z, or a combination thereof, and wherein said Sig comprises a non-polypeptide, ~~non-nucleotidyl~~, non-radioactive label moiety which can be directly or indirectly detected when so attached to said phosphate or when said modified nucleotide is incorporated into said oligo- or polynucleotide, or when said oligo- or polynucleotide is hybridized to said complementary nucleic acid of interest or a portion thereof, provided that when said oligo- or polynucleotide is an oligoribonucleotide or a polyribonucleotide and when Sig is attached through a chemical linkage to a terminal PM at the 3' position of a terminal ribonucleotide, said chemical linkage is not obtained through a 2',3' vicinal oxidation of a 3' terminal ribonucleotide previously attached to said oligoribonucleotide or polyribonucleotide, and wherein Sig comprises biotin, iminobiotin, an electron dense component, a magnetic component, a metal-containing component, a fluorescent component, a chemiluminescent component, a chromogenic component, ~~a saccharide component~~, or a combination of any of the foregoing.

1055. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein Sig comprises at least three carbon atoms.

1056. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said magnetic component comprises magnetic oxide.

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 22 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

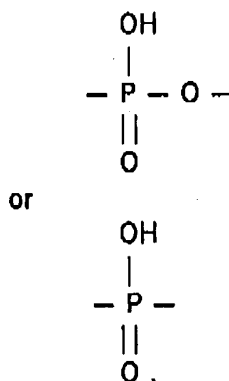
1057. (Previously Presented) The oligo- or polynucleotide of claim 1056, wherein said magnetic oxide comprises ferric oxide.

1058. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said metal-containing component is catalytic.

1059. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said fluorescent component comprises fluorescein, rhodamine or dansyl.

Claims 1060-1061. (Canceled)

1062. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said covalent attachment comprises



1063. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said chemical linkage does not interfere substantially with the characteristic ability of Sig to form a detectable signal.

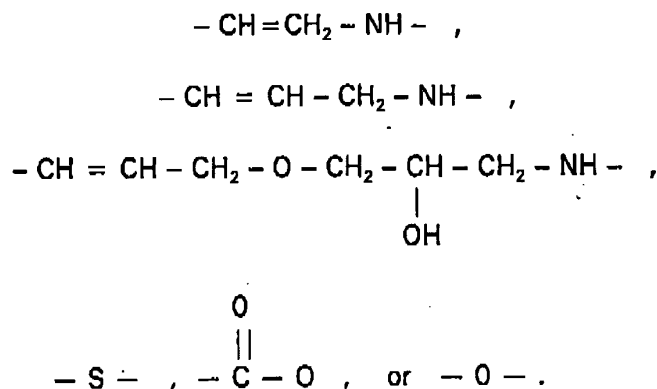
Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
 Page 23 [Second Supplemental Amendment (Following Applicants' September 3,  
 2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

1064. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said chemical linkage comprises a  $-\text{CH}_2\text{NH}-$  moiety.

1065. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said chemical linkage comprises an allylamine group.

1066. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said chemical linkage comprises any of the moieties:



1067. (Canceled)

1068. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said x comprises a monophosphate, a diphosphate or a triphosphate and y comprises a monophosphate.

1069. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said Sig moiety is covalently attached to said phosphate through a phosphorus atom or phosphate oxygen.

1070. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said x comprises a monophosphate.

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 24 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

1071. (Currently Amended) The oligo- or polynucleotide of claim 1054, wherein said Sig moiety is attached to the ~~furanosyl~~ phosphate moiety of a terminal nucleotide in said oligo- or polynucleotide.

1072. (Previously Presented) The oligo- or polynucleotide of claim 1071, wherein z of said furanosyl moiety of said terminal nucleotide comprises a hydrogen atom.

1073. (Previously Presented) The oligo- or polynucleotide of claim 1071, wherein z of said furanosyl moiety of said terminal nucleotide comprises an oxygen atom.

1074. (Previously Presented) The oligo- or polynucleotide of claim 1072, wherein y of said furanosyl moiety comprises a hydrogen atom.

1075. (Previously Presented) The oligo- or polynucleotide of claim 1073, wherein y of said furanosyl moiety comprises an oxygen atom.

1076. (Canceled)

1077. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said furanosyl moiety comprises a ribose, a deoxyribose or a dideoxyribose.

1078. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said pyrimidine analogs comprise thymidine analogs, uridine analogs, deoxyuridine analogs, cytidine analogs, deoxycytidine analogs or a combination of any of the foregoing.

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 25 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

1079. (Previously Presented) The oligo- or polynucleotide of claim 1078, wherein said uridine analogs comprise 5-bromo-2'-deoxyuridine-5'-phosphate.

1080. (Previously Presented) The oligo- or polynucleotide of claim 1078, wherein said deoxycytidine analogs comprise 5-hydroxymethyl-2'-deoxycytidylic acid.

1081. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said purine analogs comprise adenosine analogs, deoxyadenosine analogs, guanosine analogs, deoxyguanosine analogs, or a combination of any of the foregoing.

1082. (Previously Presented) The oligo- or polynucleotide of claim 1081, wherein said adenosine analogs comprise tubericidin or toyocamycin.

1083. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide.

1084. (Currently Amended) The oligo- or polynucleotide of claim 1083, wherein said oligo- or polynucleotide comprises an oligo- or polydeoxyribonucleotide and further comprises at least one ribonucleotide.

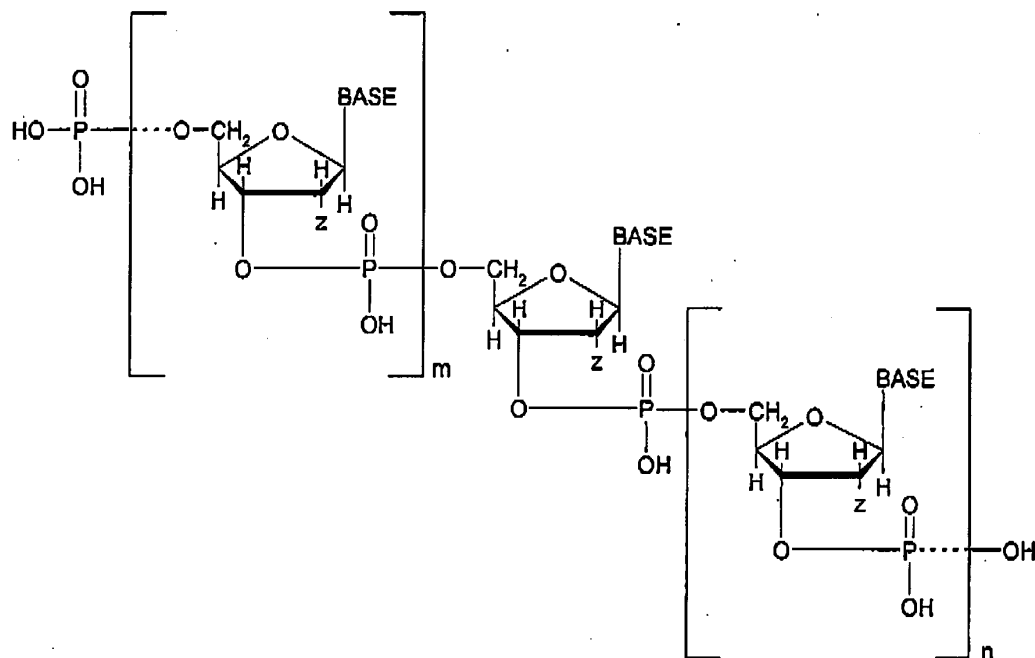
1085. (Previously Presented) The oligo- or polynucleotide of claim 1054, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide.

1086. (Currently Amended) The oligo- or polynucleotide of claim ~~1085~~ 1054, wherein said oligo- or polynucleotide comprises an oligo- or polyribonucleotide and further comprises at least one deoxyribonucleotide.

Enz-5(D6)(C2)

Dean L. Engelhardt, et al., Serial No.: 08/479,997 (Filed June 7, 1995)  
Page 26 [Second Supplemental Amendment (Following Applicants' September 3,  
2004 Amendment Under 37 C.F.R. §1.116) -- March 30, 2005]

1087. (Previously Presented) The oligo- or polynucleotide of claim 1054, having the structural formula:



wherein m and n represent integers from 0 up to about 100,000, and wherein said Sig moiety is attached to at least one of the phosphate moieties in said structural formula.

Claims 1088-1227 (Canceled)

\* \* \* \* \*

Enz-5(D6)(C2)